



MISSOURI DEPARTMENT OF  
**HEALTH &  
SENIOR SERVICES**

# **Childhood Lead Poisoning Prevention**

---

**Annual Report**

**July 1, 2023 - June 30, 2024**



# Missouri Childhood Lead Poisoning Prevention Program (CLPPP)

## Annual Report for Fiscal Year 2024

July 1, 2023 to June 30, 2024

## Childhood Lead Poisoning Prevention Program

### Mission Statement

The Missouri Department of Health and Senior Services (DHSS) Childhood Lead Poisoning Prevention Program's (CLPPP) mission is to assure the children of Missouri a safe and healthy environment through primary prevention and the identification of lead exposures that may cause illness or death.

### Operations

Established in 1993, the DHSS CLPPP is staffed by professionals in public health nursing, environmental science, epidemiology, data analysis and administrative support. Numerous nurses at local public health agencies statewide, the Department of Social Services' MO HealthNet team and managed care contractors and environmental public health staff in select counties also support the CLPPP program. As directed by statute (Section 701.343(3)), the CLPPP is supported primarily by federal funds made available for state lead poisoning prevention programs.

The program uses the Missouri Health Strategic Architectures and Information Cooperative (MOHSAIC) database to collect lead-specific data from medical providers and lead program activities. This database provides documentation of medical testing, case management, and environmental risk assessments statewide. The data is used to provide comprehensive lead case management services and for statistical information. MOHSAIC securely maintains all child and adult lead test information.

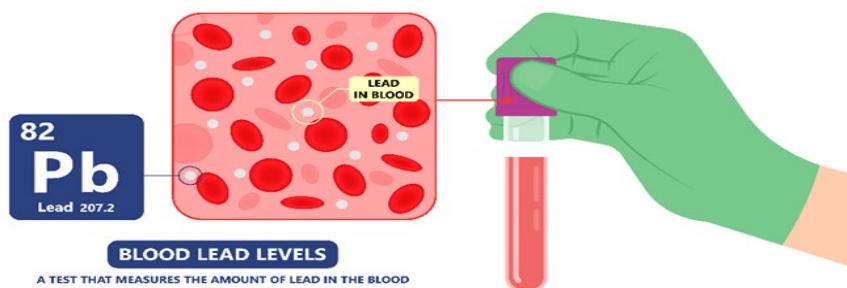
### Lead

Lead is a soft, silver-colored metal found naturally in the earth's crust. Historically, lead was used in a variety of ways, including in paints, gasoline, batteries, bullets, keys and some vinyl products such as mini blinds. Lead contained in products, fine particles of processed or recycled lead and/or lead dust becomes a health hazard when they are taken into the body through ingestion and/or inhalation.

---

### Lead dust becomes a hazard when ingested or inhaled

---





## History of Lead in Missouri

Lead mining and smelting are an important part of Missouri's history. While searching for gold and silver, French explorers discovered lead along the Meramec River in the 1700's. Missouri became the dominant lead-producing state in the U.S. in 1907 and has remained so ever since.

Most early lead production came from the Old Lead Belt district in southeast Missouri in the Park Hills-Bonne Terre area, and in the Tri-State Zinc-Lead district in southwest Missouri around Joplin. Today, all the state's lead production comes from the New Lead Belt, also known as the Viburnum Trend district. This district is a very narrow, 35-mile-long ore area extending southward from the town of Viburnum, Iron County, in southeast Missouri.

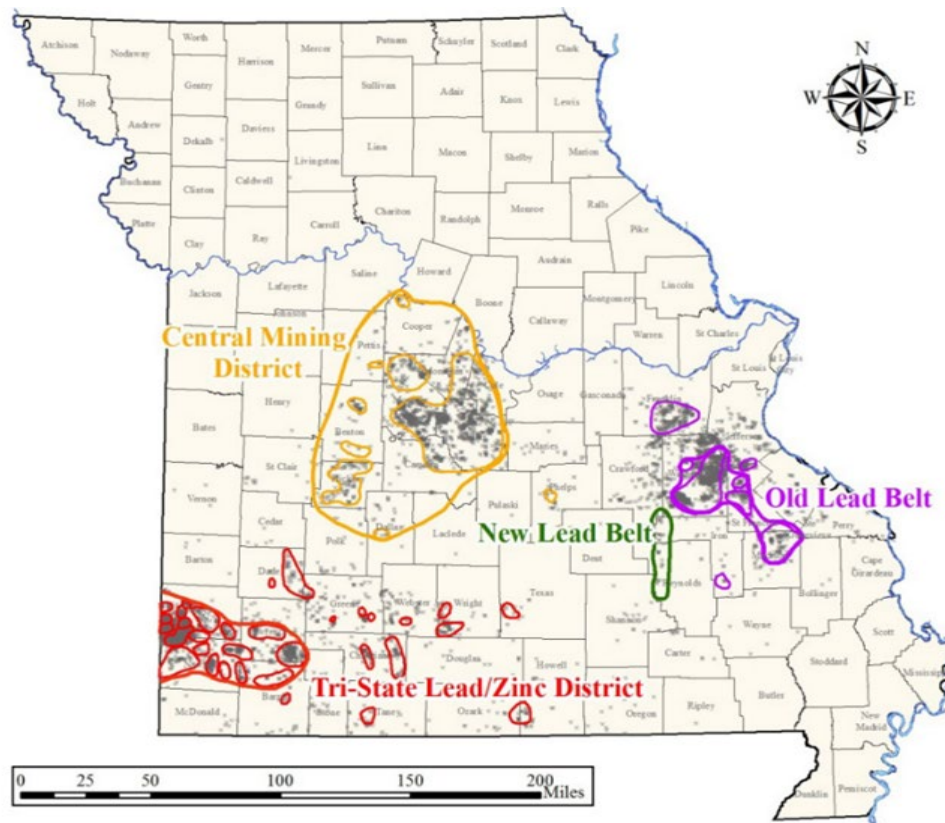
Citizens in these areas historically used mining waste products in driveways, yards and even children's play areas for generations. If children are living and playing within these historic mining areas, this can increase their blood lead levels and put them at an increased risk for lead poisoning.

Historical lead mining impacts 60 of Missouri's 114 counties and the waste create major environmental exposure issues across the state from contaminated soil and contaminated private drinking water wells. Missouri also has nine lead-contaminated sites on the U.S. Environmental Protection Agency (EPA) National Priorities List (NPL) because of the historical mining operations. MDHSS has worked with federal/state/local agencies for years to conduct health assessments, provide technical assistance, and offer blood-lead testing and health education for these lead sites (e.g., Big River Mine Tailings NPL site, Madison County Mines NPL site, Newton County Mine Tailings NPL Site, Oranogo-Duenweg Mining Belt NPL Site, Southwest Jefferson County Mining NPL site, and Washington County Lead District NPL sites) as well as other lead sites in the state. Sites, such as Missouri's lead mining sites, with widespread contamination, can take years or decades to fully investigate and remediate, and work continues each year on these sites. DHSS has noted a decline in childhood elevated blood-lead levels (EBLs) around many historical lead-mining sites in the state which is attributed to environmental remediation and health education at those sites. These successes are due to collaborative efforts to identify and mitigate exposures and educate the community about reducing exposure and making healthy lifestyle choices.





## Missouri Lead Mining Districts



Map courtesy of Missouri Department of Natural Resources, 2012

## Lead Poisoning in Missouri

Lead poisoning is one of the most common and preventable environmental health problems in today's world. The effects of lead are the same whether it is inhaled or ingested and can damage the brain, central nervous system, kidneys and immune system. Lead in the human body is most harmful to young children under six years of age and especially detrimental to children less than three years of age because their systems are developing rapidly. Children absorb up to four to five times more lead in the body than adults do. Young children are more likely to take lead into their bodies due to hand-to-mouth behaviors and their proximity to the ground. Damage from lead is irreversible and may not become apparent until later in life.

Lead can affect all body systems in children and fetuses, but primarily affects the brain and nervous system. Even low blood lead levels can cause lowered IQ's, decreased cognition, difficulty with fine motor coordination, attention deficit disorders, reading disabilities and vocabulary deficits.

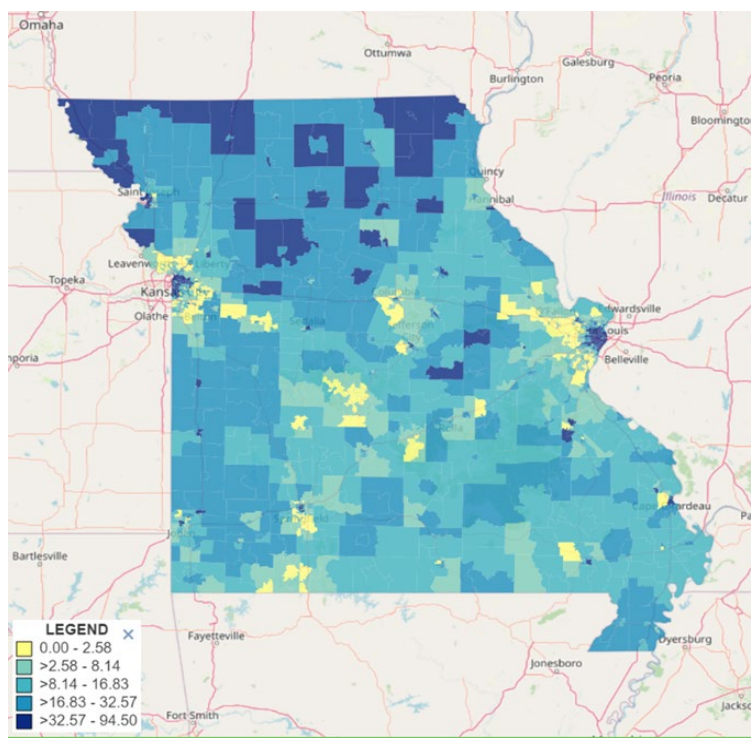


Lead poisoning often goes undetected. If symptoms occur, they can include, but are not limited to: mild toxicity symptoms can be fatigue, irritability, muscle pain, lethargy or hyperactivity. Moderate toxicity can appear as headache, abdominal pain, joint pain, difficulty concentrating, behavioral deficits, constipation or weight loss. Severe toxicity can cause paralysis, encephalopathy, seizures, coma or death. Since symptoms of lead poisoning are similar to that of other diseases, clinicians may not suspect lead poisoning at first.

In the U.S., lead dust from deteriorated lead-based paint is the primary lead hazard associated with childhood lead poisoning. The U.S. Consumer Product Safety Commission banned the manufacture of lead-based paint for residential use in 1978, homes built prior to 1978 may contain lead-based paint. The highest risk of exposure to lead dust is in homes built before 1950, when most paint contained a high percentage of lead.

Nationally, the average percentage of housing built pre-1950 decreased from 22% in 2000 to 17.2% in 2020. Missouri is above the national average with 18.5% of housing units built before 1950. The map below lists the percentage of pre-1950 housing by zip code according to the 2020 census data.

### Age of Missouri Housing



CHILDHOOD LEAD POISONING | AGE OF HOUSING | PERCENT OF HOUSING  
UNITS BY YEAR STRUCTURE BUILT | MISSOURI | Before 1950 | 2020



Explore more data at [ephtracking.cdc.gov/DataExplorer](https://ephtracking.cdc.gov/DataExplorer)





## Sources of Lead in Missouri

Drinking water and soil can be additional sources of lead exposure. Lead found in drinking water can be from groundwater contamination or from plumbing components leaching lead into the water. Lead contamination in soil can be found near areas of mining, near roadways from historical automobile emissions, or around homes where lead paint chips and dust accumulate. Lead does not go away once it is in the soil, so children may contact lead in soil while playing in these areas even years after lead was deposited there.



---

### Lead dust is a common source of lead poisoning

---

## Occupations

Individuals that handle lead at work can bring home lead on clothing and in vehicles, which can be harmful to children in the home. These occupations can include:

- Lead smelting or recycling
- Bridge reconstruction
- Auto repair
- Plumbers and pipefitters
- Steel welders and cutters
- Manufacturing of batteries, rubber products, printers, glass, plastics and ammunition

## Folk remedies

As people from other countries move to Missouri, they often bring their regions' folk remedies with them. Some of these remedies can contain high amounts of lead. For example, imported *azarcon* and *greta* is used to treat "*empacho*", a colic illness, in Mexican Folk remedies. These lead-containing remedies have multiple names such as *liga*, *Maria Louisa*, *Alarcon*, *coral* and *rueda*. In another example, remedies and cosmetics from Asia, such as *chuifong tokuwan*, *pay-loo-ah*, *ghasard*, *bali goli* and *kandu* may contain lead. Additionally, imported products from the Middle East, such as *alkohl*, *kohl*, *surma*, *saoott*, and *cebagin*, may contain lead.





## Other

Additional sources identified during follow up home assessments included:

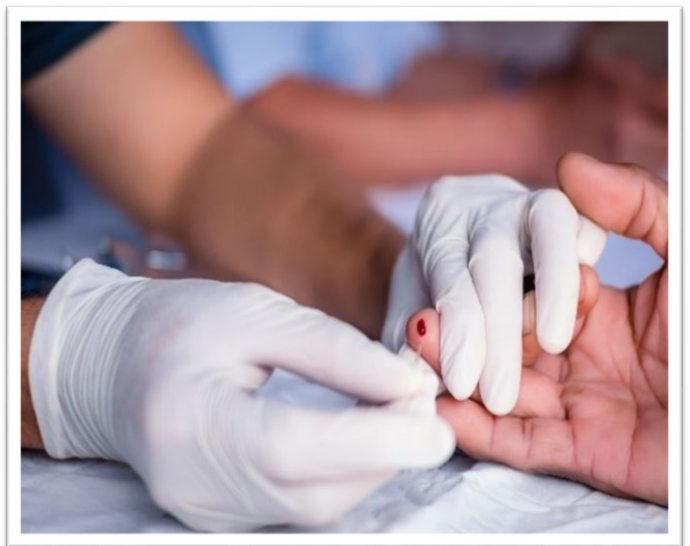
- Glazed pottery
- Stained glass
- Lead bullets
- Furniture refinishing
- Fishing sinkers
- Lead soldering or crystals
- Target shoot at firing ranges
- Mini blinds
- Leaded candle wicks

## Statewide Screening & Testing Plan

A blood test is the only way to determine the blood lead level in the body. Blood drawn from a vein (venous draw) or a finger stick (capillary sample) can measure the amount of lead in your blood. Blood lead levels are measured and reported as micrograms of lead per deciliter of whole blood ( $\mu\text{g}/\text{dL}$ ). In October 2021, the Centers for Disease Control (CDC) announced the new blood lead reference value at  $3.5 \mu\text{g}/\text{dL}$ , decreased from a previous level of  $5 \mu\text{g}/\text{dL}$ . For more information regarding the CDC's change in blood lead reference value, visit: <https://www.cdc.gov/lead-prevention/php/data/blood-lead-surveillance.html>.

In 2001, Missouri legislation (Section 701.340 to 701.349) required DHSS to create regulations to establish a statewide screening plan. The statutes and regulations define criteria for establishing geographic areas in the state considered to be high risk for lead poisoning, outline blood lead testing requirements and protocols, and define follow up for lead testing. Missouri legislation also states all children under the age of six, regardless of location or Medicaid status, be tested once.

In developing these regulations, CLPPP applied Missouri surveillance and census data to establish criteria for High-Risk Testing and General-Risk Testing areas in Missouri. Based upon these criteria, and as required by the state statute, the following activities shall occur in these two areas.





### ***High-Risk Testing Areas:***

- Childcare facilities located in High-Risk Testing Areas must record a “proof of lead testing” signed by the health care provider within 30 days of child’s enrollment. The statement must verify that a blood lead test was completed in the previous 12 months. If the parent or guardian does not provide proof or a written statement explaining why they do not want the child to be tested, the childcare facility is to offer the parent assistance in scheduling a blood lead test.

### ***General-Risk Testing Areas:***

- From six months of age to six years of age, every child will be screened annually using the Healthy Children and Youth (HCY) Lead Risk Assessment Guide to determine whether the child is at risk for lead poisoning. Responses given during the screening with the Guide may indicate the need for blood lead testing. This guide can be viewed at: <http://health.mo.gov/living/environment/lead/pdf/HCYLeadRiskAssessmentGuide.pdf>.
- Every child less than the age of six found to be at high risk will be blood tested for lead poisoning.
- All MO HealthNet eligible children shall be assessed by the HCY Lead Risk Assessment Guide and/or be blood lead tested at the ages stipulated by the Federal Program Guidelines; 12 and 24 months of age, or up to 72 months of age when no record of previous testing available.
- Health insurance plans and companies are also required to cover lead testing of all pregnant woman and children under six years of age, as required by Missouri law.

### ***Beginning August 28, 2023:***

- On August 28, 2023, Missouri regulations for lead testing in children changed (RSMo 701.340-701.342). In making these changes, testing guidelines were simplified for providers and family. Missouri lead testing requirements include:
  - All children under 72 months of age should be screened for lead risk factors using the Healthy Child and Youth (HCY) Lead Risk Assessment Guide. If a parent or guardian answers yes, or no response to any question, the child should receive a blood lead test.
  - All parents of a child under age 4 shall be provided lead education annually, and every child under age 4 shall be offered a blood lead test annually.
- All children receiving Medicaid benefits must have lead testing at 12 and 24 months of age.
- High risk area testing requirements:
  - Every childcare facility affiliated with a school system, a business organization or a nonprofit organization shall, within 30 days of enrolling a child, require the child’s parent or guardian to provide evidence of lead poisoning testing in the form of a statement from the health care professional that administered the test or provides a written statement that states the parent’s or guardian’s reason for refusing such testing.





## Testing and Reporting of Blood Lead Results

Missouri's disease and conditions reporting rule, 19 CSR 20-20.020, defines the demographic patient information required to be submitted with the report; and requires the reporting of all blood lead tests both elevated and non-elevated regardless of the age of the individual. The data contributes to Missouri's local, regional, and statewide statistics on blood lead poisoning.

The following information is required:

- Date test was conducted
- Type of specimen (capillary or venous)
- Result of the test
- Name and address of the attending physician
- Name of the disease or condition diagnosed or suspected
- Date the test results were obtained
- Patient's complete name and home address with zip code
- Patient's date of birth
- Patient's sex and race

In FY 2024, Missouri tested 70,234 children under the age of six years old for lead poisoning. Despite multiple obstacles, Missouri's testing rates have increased by 1% over the last year (Figure 1).



## Elevated Blood Lead Prevalence

In 2012, the CDC introduced a blood lead "reference value" to identify children with higher levels of lead in their blood compared to most children. This level is based on the 97.5th percentile of the blood lead values among U.S. children ages 1-5 years identified in a national health survey. Children with blood lead levels at or above this level represent those at the top 2.5% with the highest blood lead levels. Currently the national blood lead reference value is 3.5 µg/dL; however, data on Missouri children indicates the top percentage is higher at 5 µg/dL. Previously, the median was calculated resulting in a higher level, however, Missouri now



calculates the 97<sup>th</sup> percentile the same way CDC calculates the national level. The testing rates are below in Figure 1 and the elevation rates are in Figure 2.

**There is no safe blood level for children.**

### National Lead Level

**3.5 ug/dl**

Micrograms per deciliters

National lead level at the 97<sup>th</sup> percentile

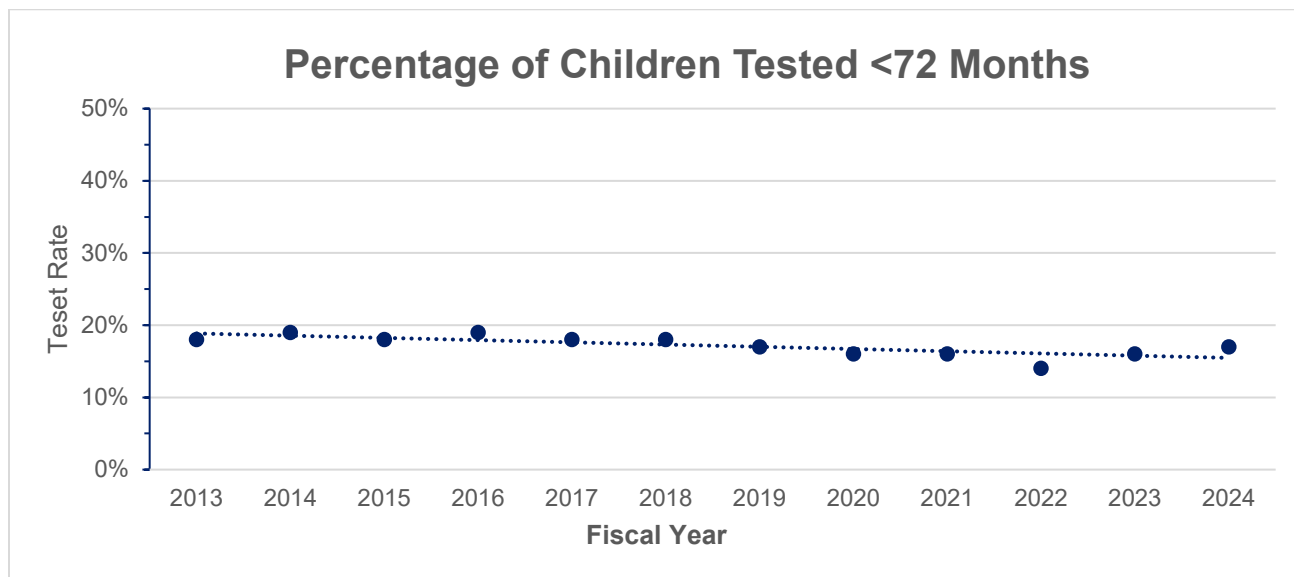
### Missouri Level

**5 ug/dl**

Micrograms per deciliters

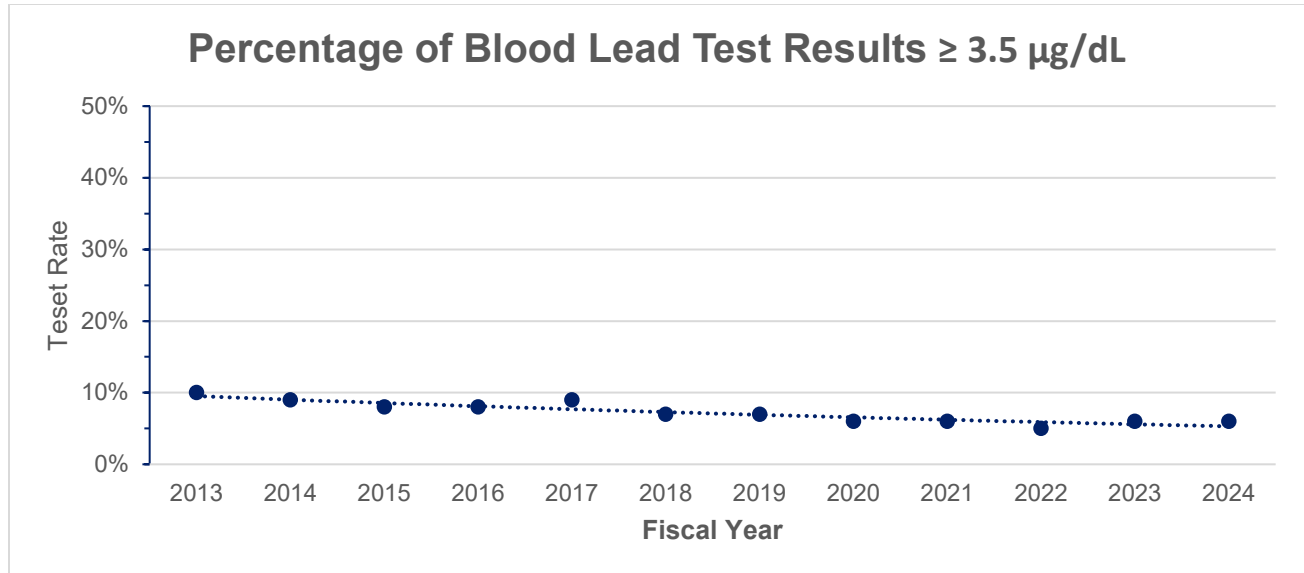
Missouri lead level at the 97<sup>th</sup> percentile

**Figure 1**





**Figure 2**



## Lead Poisoning Prevention Services

### Outreach

Lead poisoning is entirely preventable. Outreach and education is key to limiting and preventing exposure. Along with information made available on the DHSS website, CLPPP gathered resources and developed education materials that help identify sources of lead and how to address and mitigate those exposures. Many of these materials are themed to capture the attention of specific segments of the population. DHSS distributes these materials through attendance of conferences, health fairs, home shows, blood lead testing events and other public events. Educational materials can be ordered through the DHSS website at no cost.

Lead poisoning prevention week outreach activities in 2023 included several health fairs and Head Start testing events throughout the State of Missouri. During lead poisoning prevention week, video ads ran on social media to showcase information to Missouri residents. Radio and print ads with Zimmer Radio group played during Kansas City Chiefs football games.

Lead the Leadosaurus, a mascot for the DHSS lead program, interacted with children during the Governor's Harvest Festival held at the Governor's Mansion in Jefferson City. Approximately 2,200 people were in attendance.

CLPPP reaches families specifically impacted by high levels of lead through home risk assessments and encourages participation in case management activities provided by managed care plans and local county health departments. CLPPP staff provides case management training throughout the state at regular intervals and upon request to meet the needs of case managers. CLPPP nurses provide consultation upon request for clinicians, nurses, case managers and the public.





## **Case Management Services**

Case management of children with EBL levels involves coordinating, providing and overseeing the services required to help reduce the child's blood lead level. Case managers strive to reduce EBL levels to less than 3.5 µg/dL. Case management efforts include a multi-disciplinary team and are child, physician and family centered. The child's primary care physician, local public health agency (LPHA) or a MO HealthNet Managed Care health plan may provide lead case management services. Additional partners, such as behavior health professionals, school nurses, First Steps, etc. will join the team to meet the needs of the family. DHSS CLPPP staff monitor case management activities, provided by LPHA or Managed Care plans, for children identified with a blood lead level greater than or equal to 3.5 µg/dL.

The Missouri Health Strategic Architecture and Information Cooperative (MOHSAIC) system provides a centralized documented record of communications, results, case management interventions, and updated demographic information. This promotes the sharing of the findings and promoting unified support of suggested interventions made by the risk assessors following environmental investigation results.

Bureau of Environmental Epidemiology (BEE) staff have been working with DHSS Data Integration teams to establish parameters for a new health surveillance database which will house lead testing, lead case management and environmental management. This database will be called ShowMe World Care by Clinisys. In preparation for the go-live date in Fall of 2024, BEE staff have been working with the DHSS Data Integration teams to observe and test the database to ensure it is fully equipped for lead data surveillance.

## **Environmental Evaluation**

The CLPPP provides lead risk assessment services to all areas of Missouri except for six jurisdictions that provide this service directly: Jasper, Jefferson, Greene, Dent and St. Louis counties and St. Louis City and Kansas City. Lead risk assessments detect lead hazards in children's homes. Risk assessments conducted by the State of Missouri staff are offered for children age six and younger who have a confirmed venous blood lead level beginning as low as a venous level of 3.5 µg/dL, if requested by the owner/occupant of the dwelling. Most risk assessments are conducted for children with a blood lead level of 10 µg/dL or greater.

A professional, trained and licensed risk assessor, conducts a risk assessment. The risk assessor consults with the child's family to determine areas of the home where the child may encounter lead. Lead risk assessors use special equipment to analyze painted surfaces and household objects for the presence of lead. Dust, soil and water samples also determine if lead hazards exist and where they are located. Upon completing the assessment and receiving the lab analysis, the risk assessor provides the property owner and/or occupant (if other than the owner) with recommendations for reducing lead hazards.

The risk assessor revisits the home at an agreed-upon time to assure lead hazard reduction work is successful. The risk assessor collaborates with the child's parent or legal guardian, property owner, LPHA or MO HealthNet lead case manager, CLPPP staff and the child's physician as indicated, as part of their role in case management of the elevated child.



### ***Lead Licensing Program***

The Bureau's Lead Licensing Program (LLP) licenses lead abatement professionals, including lead abatement supervisors, lead abatement workers, lead inspectors, risk assessors, and project designers. The LLP requires individuals to attend accredited training in order to be licensed and are subjected to auditing for compliance with state statutes and regulations. The LLP ensures compliance to lead abatement regulations and safe work practices on active abatement projects across the State of Missouri.

### ***Childcare Licensing Inspections***

The DHSS Bureau of Environmental Health Services (BEHS) performs sanitation inspections for childcare facilities seeking licensure. As part of these inspections, staff trained as lead professionals screen for potential lead hazards and provide remediation guidance as needed.

### ***Get the Lead Out of Schools***

On August 28, 2022, the Get the Lead Out of School Drinking Water Act; 160.077 RSMo, went into effect, establishing a drinking water standard for lead at less than five (5) parts per billion for all schools and early childhood education programs that receive state funding. The Bureau established processes and guidance to assist schools in complying with the new law, including a webpage with technical documents, an online reporting platform, frequently asked questions, and other resources. The Bureau also developed fund allocation, application for funds, contracts, and invoicing processes for the \$27 million appropriated funds to support public school districts in this effort. In addition, the Bureau has participated in multiple conferences, meetings, and other outreach opportunities hosted or attended by school representatives to share information regarding the law and available resources. As required by 160.077 RSMo, schools are required to submit all water sample results to DHSS. DHSS anticipates schools will be completed with their data submissions in early 2025. A published report of the water sample data is expected to be forthcoming after the required data has been reviewed and evaluated.

### ***Water Infrastructure Improvements for the Nation (WIIN) Program***

DHSS is committed to addressing lead in drinking water in our schools and childcare facilities and overall reduction of childhood lead exposure across our state. With the funding appropriated under section 1464(d) of the Safe Drinking Water Act, amended by the Water infrastructure Improvement Act (WIIN) section 2107, Missouri DHSS began the Initiative of testing our schools and childcare facilities. Missouri DHSS began this work with the FY 2019 grant: with the grant recently ending on September 30, 2024. With the FY 2019 grant, Missouri DHSS tested 15 schools and 122 childcare facilities, DHSS was also awarded the FY 2020 grant and FY 2021 grant. Work has recently started on FY 2020 with Missouri DHSS already working with 48 childcare facilities and 4 schools. Recently, Missouri DHSS amended the FY 2020 and FY 2021 grants to add remediation funding and applied for FY 2022 and FY 2023 grants. Goals continue to include assistance with development of sample site plans; initial sampling; and remediation. Community outreach to schools and childcare facilities will be the main priority so that schools and childcare facilities know of this opportunity and learn important information about lead in drinking water.



## ***Adult Blood Lead Epidemiology Surveillance (ABLES) Program***

The Missouri ABLES program has participated in the National ABLES Program since 2001. The program objective is to build state capacity to initiate, expand, or improve adult blood lead surveillance programs which can accurately measure trends in adult BLLs and which can effectively intervene to prevent lead over-exposures. All blood lead testing of Missouri residents is reportable to the Missouri Department of Health and Senior Services (DHSS) under the Missouri Code of State Regulations, 19 CSR 20.20-020 regardless of patient age or blood lead laboratory result. Non-identifying patient-level data are reported to NIOSH for surveillance purposes. Missouri companies with worker BLLs that warrant removal from lead exposure per OSHA Lead Standards are reported to OSHA via a memorandum of understanding established between the two agencies.

## **Program Advancements**

- Statutory changes were proposed during the State Fiscal year and passed during this time. The new statute changes went into effect August 28, 2023, and are listed under testing guidelines.
- Review of literacy and educational level of risk assessment paperwork with Health Literacy Media.
- Title V block grant funding was used to purchase LeadCare analyzers and test kits to enhance access to testing in vulnerable communities.
- During Fall 2023, several Head Start testing events were done throughout the state. In these testing events, 354 children were tested for lead poisoning which identified 55 children with an elevated blood lead level above or equal to the CDC's blood lead reference value of 3.5 mcg/dL.
- FY24 over 100 homes were assessed for lead hazards by DHSS licensed risk assessors.
- LeadCare II analyzers were placed in eight local county health departments to increase access to testing.
- In collaboration with DHSS Women, Infants and Children (WIC) program, CLPPP created a new publication titled "Well Fed Means Less Lead." This publication targets families with lead poisoned children, emphasizing lead poisoning and the importance of good nutrition.
- Through CLPPP's Lead Advisory Committee, a lead infographic was created with children and schools in mind. At the request of many educators, the Lead Advisory Committee also created a Frequently Asked Questions (FAQ) Guide for educators to answer questions about lead poisoning and the effects on school-aged children.

## **Collaborative Partnerships**

The CLPPP collaborates with multiple stakeholders to provide safe and healthy environments for Missouri children to learn and grow.

Stakeholders include, but are not limited to:

- Agency for Toxic Substance and Disease Registry (ATSDR)
  - Brownfield Project
  - Exposure investigation
- Environmental Protection Agency (EPA)
- Missouri Department of Natural Resources (MDNR)
- DHSS Lead Licensing Program
- DHSS Healthy Drinking Water programs







- Missouri Department of Social Services, MO HealthNet Division (MHD)
- Missouri Managed Care Plans
- Women, Infant, and Children (WIC) Program
- Missouri Department of Economic Development (DED)
  - Community Development Block Grant
- Missouri Housing Commission
- Missouri Local Public Health Agencies (LPHAs)
- Missouri Department of Elementary and Secondary Education (DESE)

### ***Lead Advisory Committee***

In 2022, the CLPPP Lead Advisory Committee was created. Quarterly, a diverse group of stakeholders meet to discuss impacts of lead across the state. The committee has identified three focus areas: policy, outreach, and education. CLPPP met the goal of policy through the statutory change to move to universal testing of all children age 3 and under. CLPPP is also working on a regulatory change to increase access to case management throughout the state. The outreach goal was met through the creation of a teacher's FAQ guide, a school infographic, a nutritional brochure in collaboration with WIC, and currently creating a brochure for comforting a young child through a medical procedure. Education has been carried out throughout the state through multiple case management trainings involving different regions of the state, provider outreach, and trainings to different programs within other departments.



Bureau of Environmental Epidemiology

PO Box 570

Jefferson City, MO 65102

<http://health.mo.gov/living/environment/lead/index.php>

[leadsafe@health.mo.gov](mailto:leadsafe@health.mo.gov)

*Phone: 573-751-6102*

This report evaluating the childhood lead poisoning prevention program has been created per §701.343, RSMo.